Appl. No. : 10/600,145 Filed : June 19, 2003

AMENDMENTS TO THE SPECIFICATION

Please replace the paragraphs 0020 and 0041 of the specification with the following, in which added text is underline.

One embodiment of an expression vector of the present invention contains [0020] an OmpF promoter and part or all of the OmpF gene. A method for extracellular production of a desired protein employs an expression vector comprises a gene encoding an oligopeptide which is recognised and cleaved by a proteolytic enzyme and a gene encoding a desired protein introduced into the expression vector pOmpF6 to construct a recombinant expression vector that produces the desired protein extracellularly. This or an equivalent expression vector is then transformed into a host microorganism lacking the OmpF gene to obtain a transformed microorganism. The transformed microorganism is then cultured and produces an OmpF-fused protein from the culture. Lastly, the fused protein is treated with a proteolytic enzyme and the desired protein obtained. Available proteolytic enzymes include, but are not limited to: Factor Xa, enterokinase (Asp-Asp-Asp-Asp-Lys, SEQ ID NO:19), genenase(His-Tyr or Tyr-His), IgA protease (Pro/Ser-Arg/Thr-Pro-Pro-Thr/Ser/Ala-Pro, SEQ ID NO:20), intein, thrombin, trypsin, pepsin and subtilisin or plasmin, preferably Factor Xa. Available desired proteins include, but are not limited to: peptides, enzymes and antibodies that can be fused to OmpF, preferably βendorphin. Microorganisms can be Escherichia sp. or Samonella sp., but are not limited to these preferred host microorganisms.

[0041] As shown in Table 1 above, 2.8 mg of β -endorphin was purified by the technique of HPLC. Further, N-terminal sequencing of purified β -endorphin revealed that the amino acid sequence is Tyr-Gly-Gly-Phe-Met-Thr-Ser-Glu-Lys (SEQ ID NO:21), which corresponds with N-terminal amino acids of β -endorphin.